# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 1 March 2001**

Page

Portrait of President Nan M. Crossland ..... *Frontispiece*

2000 WATER RATE SURVEY FOR MASSACHUSETTS COMMUNITIES ..... 1
By Mary Beth Morris

ALTERNATIVE DISINFECTION STRATEGIES FOR SMALL SYSTEMS
By James P. Malley, Jr., Gregory A. Snicer and Annette M. Doucette ..... 41

UV REACTOR VALIDATION/CERTIFICATION
By Harold B. Wright and Yuri A. Lawryshyn . ..... 64

PRESSURE- AND VACUUM-DRIVEN MEMBRANE PROCESSES FOR DRINKING WATER TREATMENT
By Joseph G. Jacangelo ..... 73

POINT-OF-USE/POINT-OF-ENTRY SYSTEMS
By James A. Goodrich, Roy C. Haught and Joseph Harrison ..... 89

PROCEEDINGS
Joint NEWWA & RIWWA Meeting - November 16, 2000 ..... 103
Association Meeting - December 21, 2000 ..... 106
Joint Association Meeting with NHWWA & GMWEA - January 18, 2001 ..... 109
REPORT OF THE STANDARDS COUNCIL ..... 112

LETTER TO THE EDITOR ..... 126

MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 21a
DIRECTORY OF SERVICES ..... 33a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 1 March 2001**

Page

Portrait of President Nan M. Crossland ..... *Frontispiece*

2000 WATER RATE SURVEY FOR MASSACHUSETTS COMMUNITIES ..... 1
By Mary Beth Morris

ALTERNATIVE DISINFECTION STRATEGIES FOR SMALL SYSTEMS
By James P. Malley, Jr., Gregory A. Snicer and Annette M. Doucette ..... 41

UV REACTOR VALIDATION/CERTIFICATION
By Harold B. Wright and Yuri A. Lawryshyn . ..... 64

PRESSURE- AND VACUUM-DRIVEN MEMBRANE PROCESSES FOR DRINKING WATER TREATMENT
By Joseph G. Jacangelo ..... 73

POINT-OF-USE/POINT-OF-ENTRY SYSTEMS
By James A. Goodrich, Roy C. Haught and Joseph Harrison ..... 89

PROCEEDINGS
Joint NEWWA & RIWWA Meeting - November 16, 2000 ..... 103
Association Meeting - December 21, 2000 ..... 106
Joint Association Meeting with NHWWA & GMWEA - January 18, 2001 ..... 109
REPORT OF THE STANDARDS COUNCIL ..... 112

LETTER TO THE EDITOR ..... 126

MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 21a
DIRECTORY OF SERVICES ..... 33a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

Volume 115, No. 2 June 2001

Page

MWRA'S EXPERIENCE WITH CORROSION CONTROL
By Windsor Sung, Tiffany Tran, and D. Kelly O'Day ..... 129

MINIMIZING INFRASTRUCTURE DETERIORATION
By Scott H. Paul ..... 139

PARTICLE COUNTERS - A SIMPLE METHOD TO VERIFY INSTRUMENT PERFORMANCE
By Robert L. Bryant ..... 148

EVALUATING AND UTILIZING TRENCHLESS TECHNOLOGY FOR UNDERGROUND UTILITY PROJECTS
By Timothy M. Stinson ..... 151

ADVANCED SINGLE-JET TECHNOLOGY FOR COMMERCIAL METER APPLICATIONS
By Mark Shamley and Christopher Kent ..... 157

REPORTS FROM THE AWWA RESEARCH FOUNDATION ..... 166

PROCEEDINGS
Joint Meeting with Maine Water Utilities Association, February 12-13, 2001 ..... 176

MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 22a
DIRECTORY OF SERVICES ..... 24a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 3 September 2001**

Page

A CASE STUDY IN THE DEVELOPMENT OF A MUNICIPAL BEDROCK WATER SUPPLY - MAYNARD, MASSACHUSETTS ..... 177
By Robert A. Leitch and David G. Harwood

XERISCAPE GARDENING ..... 181
By Wayne P. Southworth

FLOW AND LEVEL CONTROL MODERNIZATION OF THE CHICOPEE VALLEY AQUEDUCT SYSTEM ..... 184
By Gary D. Jacobson and Richard Udden

HOW CAN I DO MORE WITH LESS ..... 191
By Marc Wey

PURE WATER FOR THE WORLD ..... 193
By Ken Welch

REPORTS FROM THE AWWA RESEARCH FOUNDATION ..... 195

CALL FOR *JOURNAL* PAPERS AND COVER PICTURES ..... 235

PROCEEDINGS
Joint Regional Operations Conference & Exhibition - April 4 & 5, 2001 ..... 236

MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 22a
DIRECTORY OF SERVICES ..... 24a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 4 December 2001**

Page

THE ORIGINS OF ENVIRONMENTAL ENGINEERING:
PROLOGUE TO THE 20TH CENTURY ..... 253
By George E. Symons

FLOWCHARTS FOR THE SELECTION OF LEAD AND COPPER
CORROSION CONTROL STRATEGIES ..... 288
By Jonathan Clement, Michael R. Schock, Catherine M. Spencer, Stephen C. Olson, Jim Dwyer, Barbara K. Cook, and Wendy Marshall

CRITICAL INFRASTRUCTURE PROTECTION AND COUNTERTERRORISM ..... 313
By Gay Porter DeNileon

CAST IRON PIPE AND THE INFRASTRUCTURE -
AN INDUSTRY PERSPECTIVE ..... 322
By Earl J. Brown

REMARKS AT THE 2001 NEWWA ANNUAL CONFERENCE ..... 326
By Robert W. Varney

PROCEEDINGS
Joint Meeting with New England Water Environment Association, June 5, 2001 ..... 329
Annual Conference, September 16-17, 2001 ..... 331
including Reports of the Treasurer, NEWWA Executive Director, *Journal* Editor, Tellers of the Election, Administration Council, and External Affairs Council

NEWWA ORGANIZATION CHART 2001-2002 ..... 374

ANNUAL INDEX
MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 28a
DIRECTORY OF SERVICES ..... 30a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 3 September 2001**

Page

A CASE STUDY IN THE DEVELOPMENT OF A MUNICIPAL BEDROCK WATER SUPPLY - MAYNARD, MASSACHUSETTS ..... 177
By Robert A. Leitch and David G. Harwood

XERISCAPE GARDENING ..... 181
By Wayne P. Southworth

FLOW AND LEVEL CONTROL MODERNIZATION OF THE CHICOPEE VALLEY AQUEDUCT SYSTEM ..... 184
By Gary D. Jacobson and Richard Udden

HOW CAN I DO MORE WITH LESS ..... 191
By Marc Wey

PURE WATER FOR THE WORLD ..... 193
By Ken Welch

REPORTS FROM THE AWWA RESEARCH FOUNDATION ..... 195

CALL FOR *JOURNAL* PAPERS AND COVER PICTURES ..... 235

PROCEEDINGS
Joint Regional Operations Conference & Exhibition - April 4 & 5, 2001 ..... 236

MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 22a
DIRECTORY OF SERVICES ..... 24a
TRAINING CALENDAR ..... Inside back cover

# Journal of the New England Water Works Association

## Contents

**Volume 115, No. 4 December 2001**

Page

THE ORIGINS OF ENVIRONMENTAL ENGINEERING:
PROLOGUE TO THE 20TH CENTURY ..... 253
By George E. Symons

FLOWCHARTS FOR THE SELECTION OF LEAD AND COPPER
CORROSION CONTROL STRATEGIES ..... 288
By Jonathan Clement, Michael R. Schock, Catherine M. Spencer, Stephen C. Olson, Jim Dwyer, Barbara K. Cook, and Wendy Marshall

CRITICAL INFRASTRUCTURE PROTECTION AND COUNTERTERRORISM ..... 313
By Gay Porter DeNileon

CAST IRON PIPE AND THE INFRASTRUCTURE -
AN INDUSTRY PERSPECTIVE ..... 322
By Earl J. Brown

REMARKS AT THE 2001 NEWWA ANNUAL CONFERENCE ..... 326
By Robert W. Varney

PROCEEDINGS
Joint Meeting with New England Water Environment Association, June 5, 2001 ..... 329
Annual Conference, September 16-17, 2001 ..... 331
including Reports of the Treasurer, NEWWA Executive Director, *Journal* Editor, Tellers of the Election, Administration Council, and External Affairs Council

NEWWA ORGANIZATION CHART 2001-2002 ..... 374

ANNUAL INDEX
MEETING SCHEDULE ..... 4a
ON THE COVER ..... 5a
INDEX TO ADVERTISERS ..... 28a
DIRECTORY OF SERVICES ..... 30a
TRAINING CALENDAR ..... Inside back cover